

THE macdonald JOURNAL

OCTOBER 1974



MJ
The Library
Box 256, Macdonald College
P.Q.
H9X 3M1

MACDONALD JOURNAL

Only \$7 for 2 years,

\$9 for 3 years,

**\$10 for 2 years
outside Canada.**

MACDONALD JOURNAL,
58 Madsen Blvd.,
Beaconsfield 870, P.Q.

Please enter my subscription for _____ years

at a cost of _____

☐ CHEQUE ENCLOSED

☐ INVOICE ME, PLEASE

Name _____

Address _____

THE macdonald Journal

October 1974

Macdonald Journal
Volume 35, No. 10
October 1974

Editor: Gordon Bachman
Managing Editor: Hazel M. Clarke
Associate Editor: Tom Pickup
Family Farm, Office of Information,
Quebec Dept. of Agriculture
Advertising Manager: R. J. Cooke
Production: Marie Labossière
Circulation: Mildred Young

The Macdonald Journal is published
every month by Ronald J. Cooke
Ltd., 58 Madsen Ave.,
Beaconsfield, Quebec, 514 697-3614

Texts in this issue may be reprinted
editorially without permission;
permission should be obtained to
reproduce illustrations. Address
The Editor, Macdonald College,
Quebec. Second class mail registra-
tion number 0463.

Subscription rates are \$7.00 for
two years, \$9.00 for three years
in Canada, U.S.A., and foreign
rates are \$10.00 for two years.
Printed in Canada

In This Issue

Guest Editorial	2
Cassava: What's It Doing In Canada?	3
Warfare in the Plant Kingdom	7
Agriculture in a Test Tube	9
The Family Farm	12
This Month with the QWI	17

Journal Jottings

Some of our articles are so timely
that occasionally I fear that even
our one month advanced deadline
before publication date may be
too long a wait for the material
to appear in print. This usually
happens when an unscheduled
article hits my desk, and it is so
topical that other material must
either be squeezed in or rescheduled.
Or some event takes place on
Campus that warrants an imme-
diate write-up. These are the times
when I envy the daily newspaper.
But, for the most part, unlike
the hectic pace and hurried writing
of the daily, our articles may be
scheduled for appropriate issues
and may take months before they
are printed. A case in point is that
there is already an article scheduled
for the November, 1975, Journal.
We have the idea now, but by
that time most of the pertinent
facts will be known, months of
research will be concluded, and
some conclusions should be
reached.

A somewhat similar case is our lead
article in this issue "Cassava:
What's It Doing in Canada?"
This article might be called an
introductory article on an inter-
esting subject and an interim
report on what has happened to
date. About a year and a half ago
I learned that Professor Peterson,
of the Department of Plant
Pathology, was to undertake
research on Cassava, a staple food
for some 300 million people.
It was an international agricultural
story and I immediately jotted
down the information. Months
later I learned that he and
Professor Steppeler, of the Depart-
ment of Agronomy, travelled to
the International Institute of
Tropical Agriculture (IITA) in
Nigeria for further information and
study on this plant. Again a note
to pursue the story. Just about
a year ago I decided the time was
ripe to ask if and when we might
schedule an article on his research.

Next October was the answer
and here, one year later, is the
article. And already I have made
a note that we should have a
follow-up article when the results
of the research being conducted
here at Macdonald become more
conclusive.

A more familiar name to Canadians
for cassava may be tapioca —
the dessert that many may
remember as coming before the
night that they had bread pudding
and the night after they had had
rice pudding. Apart from the fact
that I think I liked tapioca pudding
as a child, I believe that it is of
immense importance that we
let our readers know that we at
Macdonald are not only concerned
with problems in Quebec agri-
culture, in Canadian agriculture
but are also very much involved
in the global scene. We hope in the
next year or so to bring you more
articles along similar lines.

Hazel M. Clarke.

The Ontario Agricultural College of the University of Guelph is this year completing one hundred years of service to agriculture. A hundred years ago, farming — the tilling of soil and the raising of livestock — was not considered to require any particular skill. Almost anyone interested in farming was considered to be amply qualified for the business. During the past century, a great deal of knowledge has been accumulated, and agriculture has become an exacting science, requiring well-developed skills and careful training. Considerable credit for our present-day knowledge of agriculture must go to our sister institution.

The Ontario School of Agriculture, as it was originally named, was established with the purchase of the William Stone farm near Guelph in 1873. The first students enrolled on May 1, 1874. Associated with the School, though administratively separate in the early years, was a Model Farm. The 31 male students enrolled in the original one-year course were expected to spend seven hours a day working in the fields and barns, and to find other time for studying. In 1880 the name was changed to the Ontario Agricultural College and Experimental Farm, and a two-year diploma program initiated. This is still being offered.

As with any important new venture, the School had its growing pains, not the least of which resulted from skepticism and mistrust on the part of the rural public. Not only did farmers feel that their educated sons would soon disappear from the farms, but they were convinced that in no way could a professor be familiar with practical farming problems. This

mistrust stemmed largely from a lack of public knowledge about the School and what it was attempting to do. To overcome this problem, the Principal of the time, James Mills, introduced two-week vacation periods at Easter and Christmas in 1883 to provide time for his Faculty to meet farmers in their own communities and speak at local meetings. This represented the beginning of the rural extension program in Ontario. In addition, summer excursions to the College were organized with the assistance of the railways to further acquaint the general public with its activities. Despite these efforts, almost 40 years passed before the College was completely accepted by the people of rural Ontario.

In 1888, the Ontario Agriculture College became affiliated with the University of Toronto, and graduated its first five degree students with a Bachelor of Science in Agriculture degree from the University. This affiliation continued until 1964, when the University of Guelph was formed from the Federated Colleges — the Ontario Agricultural College, the Ontario Veterinary College, and the Macdonald Institute.

From the very beginning, the Ontario Agricultural College has been devoted to seeking out the needs of the farming public and developing programs to satisfy these needs. Introduction of new crops and improved varieties of existing crops; development of better application procedures for insecticides and herbicides; promotion of soil testing, fertilizer usage, and soil conservation; increased use of computers to analyze livestock production data and improved business management techniques are only a few of the College's contributions over the years.

The B.S.A. degree is recognized around the world as the culmination of sound academic training combined with a practical background. The continual updating of courses, the introduction of new courses and programs, and the gradual expansion of teaching and research staff, as the decades have passed, have resulted in a College that now boasts an undergraduate enrollment exceeding 2,000, over 200 graduate students, and a correspondingly active research program.

To quote from the 1971 Report on the Programs and Organization of the O.A.C. for the Seventies, "The objective of the O.A.C. is to serve people. Its greatest impact is in the agricultural and food system and in the improvement of the rural environment. It will meet this objective through excellence in teaching and research, and through its ability in extension to communicate its findings to the public."

While the Ontario School of Agriculture was designed by the founding fathers to serve rural Ontario, the contributions of the O.A.C. go far beyond provincial boundaries, indeed extending around the world. They go beyond rural needs and serve urban dwellers as well.

On this Centennial occasion, we at Macdonald College extend our hearty congratulations to our sister institution for its 100 years of agricultural progress and service. As this well-known College begins its second century, we look forward to still greater contributions to our ever-expanding knowledge of agriculture and its related sciences.

H. R. Klinck, O.A.C. '50

What's It Doing In Canada?

by Professor Jean Peterson,
Department of Plant Pathology

A staple food for millions, Cassava, according to the dictionary, is "(1) Any of several tropical euphorbeaceous plants of the genus *Manihot*, as *M. esculenta* (bitter cassava) and *M. dulcis* (sweet cassava), cultivated for their tuberous roots, which yield important food products. (2) a nutritious starch from the roots; the source of tapioca". (American College Dictionary, Random House, N.Y.)

The use of cassava is not restricted to English-speaking areas, so it has several regional names. According to Dr. T. Phillips, a University of Guelph economist who has studied its use and potential markets, "The plant is called cassava in English-speaking regions of North America, Europe, and Africa. In French-speaking areas it is called manioc. It is referred to as tapioca in English-speaking parts of Southeast Asia, as mandioca in Brazil, and as yuca in Spanish-speaking regions of South America."

Dr. Phillips also tells us that cassava probably originated in Brazil and spread to other parts of Latin America as early as 800 B.C., and then spread to other tropical areas. Presently cassava is grown in various tropical countries lying between the latitudes of 30° north and 30° south of the equator. This "Cassava Belt" includes various countries classified as "less developed" by the FAO, and accounts for nearly half (46 per cent) of the world's arable land, 47 per cent of its population, but only 13 per cent of the world's Gross Domestic Product. Cassava possesses several characteristics which favour its production and suitability for small-scale subsistence agriculture:

1. It is easily propagated from stem or stalk cuttings; no seeds or roots are needed for future plantings.
2. It is relatively high yielding (in terms of calories per acre and per cent edible dry weight).
3. It is relatively inexpensive to produce — is easily planted and harvested, and requires little weeding because of the leafy canopy formed by the (shrub-like) plants. There is no critical planting or harvesting time so it can be grown in any season.
4. It is capable of growing on soil considered too poor for other

crops, and is somewhat more resistant to insect and disease attacks — including those of migratory locusts.

5. It is a reliable food staple and an excellent source of carbohydrates.

Although it has been considered an inferior food because of its high content of starch, cyanogenic glucosides, and low protein content, the above traits have served to make cassava a traditional subsistence crop of low-income farmers in the tropics; it is estimated that it provides a major source of carbohydrates for 300 million people.



An excellent example of cassava roots which are not only used for human consumption but also as livestock feed. — Photo courtesy IDRC.

In addition to its main use as human food, cassava is also used as a livestock feed and as a source of industrial starch. In the last 10 years a substantial trade has developed in the use of dried cassava products as animal feed, so that some Asian countries have been exporting cassava to members of the European Economic Community.

Besides its usual tropical locations, cassava is now being grown for studies at several locations in Canada, essentially as part of Canada's contributions to foreign aid and development. These projects are supported by the Agriculture, Food and Nutrition Division of the International Development Research Centre (IDRC), a crown corporation established in 1970 by an Act of Parliament to

"initiate, encourage, support, and conduct research into the problems of developing regions of the world and into the means for applying and adapting scientific, technical, and other knowledge to the economic and social advancement of these regions ..."

The IDRC is unusual among nationally financed international development organizations in that its Board of Governors is an international group, which includes representatives from less developed regions. The president of the IDRC is W. David Hopper (Macdonald graduate), and Louis Rasminsky serves as Chairman of the Board of Governors.

The cassava projects are funded by contributions from the Canadian International Development Agency

(CIDA), which the IDRC manages on behalf of that agency. In the last five years two major new international agricultural research institutions have been established which have substantial research programs dealing with cassava. A world collection of cassava varieties is being established at the Centro Internacional de Agricultura Tropical (CIAT) in Columbia, and at the International Institute of Tropical Agriculture (IITA) in Nigeria, a considerable emphasis is placed on research with cassava and yams. Both of these institutes receive substantial support from the IDRC, which is heavily committed to funding cassava research.

In accomplishing its objectives, the IDRC hopes:

- "a) to enlist the talents of natural and social scientists and technologists of Canada and other countries;
- b) to assist the developing nations to build up the research capabilities, the innovative skills, and the institutions required to solve their problems;
- c) to encourage generally the coordination of international development research; and
- d) to foster cooperation in research on development problems between the developed and developing regions for their mutual benefit."

Thus, a portion of the CIDA-IDRC contributions to international research institutes is designated to support research within Canadian institutions which is relevant to the efforts of the international centres. This enables

undertaking research which might not be possible at the international centres (for example, work requiring specialized equipment or techniques not available at the centres), and promotes close communications between Canadian research institutes and the international institutes as well as acquainting Canadian researchers with tropical agricultural problems and how to deal with them. There are presently several cassava projects at various locations in Canada, including two here at Macdonald. One of these, directed by Dr. W. F. Grant of McGill's Genetics Department, involves the use of chromatographic techniques to enable the classification of CIAT's collection of cassava varieties into related groups, which can then be related to desirable agronomic characteristics. The other project here involves the investigation of a severe disease of African cassava, loosely referred to as "cassava mosaic virus".

Virus and virus-like diseases have long posed an economic threat to cassava production, particularly in Africa. "Cassava mosaic" is prevalent in all African cassava growing countries and has been reported in Brazil, Indonesia, and India. In Africa yield losses attributed to cassava mosaic range from 14 - 95 per cent.

Unfortunately, there may be as many kinds of "cassava mosaic" as there are major areas, so it is necessary to sort out some confusing terminology. Virologists in Brazil have identified about half a dozen virus diseases of cassava, and the proper name for their cassava mosaic is actually

Healthy and diseased: the leaves at right are victims of the cassava mosaic "virus".



cassava common mosaic. The Brazilian viruses are mainly spread by the use of stem cuttings from diseased parent material — similar virus dissemination often occurs in North America when bulbs, tubers, or rootstocks of diseased plant material are vegetatively propagated. (These viruses decrease yield, and may cause flower "streaking" or variegation, but fortunately, cause no ailments in the users of the food — relatively few potatoes are virus-free).

The situation with the African mosaic disease is a bit more complicated. In addition to being spread by the use of diseased stem cuttings (little virus-free material is available), the causal agent of the disease is also spread to and from young leaves by an insect, known to entomologists as *Bemisia tabaci*, and to plant virologists as "the sweet potato whitefly". The African

cassava mosaic was first described in the 1880s, and there are several other similar diseases in tropical regions affecting economically important crops such as long staple cotton and tobacco, but these whitefly-transmitted "viruses" have been the objects of relatively little research — probably partly because in tropical regions disease problems have vastly out-numbered plant pathologists, and partly because the whole area of plant virus disease work is a relatively youthful one. About all that is known of whitefly transmitted viruses is that historically they have proven to be difficult subjects to work on, and as yet it has been impossible to positively isolate and identify any virus particles involved in any whitefly transmitted "virus" disease.

The whitefly carriers also necessitate some international quarantine precautions, because in

Latin America there are plenty of the same kind of whiteflies, but they haven't learned to carry the native cassava viruses around, yet. Thus, the Latin American countries, quite justifiably, do not want to risk the introduction of whitefly-borne diseases into their cassava, so African material is kept out of Latin America. Canada thus affords a neutral territory; neither the cassava plant nor the tropical whitefly is indigenous here because of the extremely non-tropical nature of our winter climate. On the other hand, it is possible to grow cassava in our heated greenhouses and growth chambers, and our greenhouses are often infested by a different whitefly, the "common greenhouse whitefly". It is sometimes difficult to decide whether we have the best or the worst of two worlds.

The work being done here is laboratory oriented, because we have some specialized laboratory equipment here which would not be easy to maintain at the international centres. The long range objectives of the project include the identification and characterization of the viruses and virus-like agents infecting African cassava, and the development of methods of handling these agents and assaying for their presence, which would be of use to workers involved in developing resistant cassava varieties.

Most plant viruses which have been thoroughly studied can be "mechanically transmitted" by rubbing extracts of infected plants onto the leaves of healthy plants. Unfortunately, this has not worked so far for any of the whitefly-transmitted "viruses", and it is one

Heated greenhouses and growth chambers enable us to grow cassava under the required "tropical" conditions.

of the reasons for regarding them as difficult research projects; however, the long establishment of this generalization has probably discouraged much effort at mechanical transmission. This type of transmission, to a more convenient greenhouse plant than cassava, would aid our studies considerably, and could also serve plant breeders as an indexing tool. Meanwhile, we can maintain our "virus" by propagating infected stem cuttings, and, if necessary, transmit it to other cassava varieties by grafting.

In addition to the usual methods involving attempts to extract, concentrate, and partially purify the virus, and searching for suspected virus particles in tissues and extracts with the electron microscope, we are also investigating the possibility that the disease may be caused by an even smaller agent, called a "metavirus" by some workers, and "viroid" by others. Most plant viruses consist of a strand of ribonucleic acid (RNA) enclosed in a coat or shell made up of closely packed units or globules of protein and are either rod-shaped or spherical. Recently, however, two or three plant "virus" diseases have been shown to be caused by viroids or small pieces of RNA without any protein coat. The lack of a protein coat necessitates detection by comparisons of RNA fractions obtained from healthy and infected plants. Identity of the suspected RNA fraction as a disease-causing agent is usually confirmed by mechanical inoculation tests — which is another reason for further investigating mechanical transmission, as there is some circumstantial evidence that



cassava mosaic may be caused by a viroid rather than a proper virus.

Although we haven't unlocked the

mysterious nature of whitefly-transmitted "viruses" yet, we hope our approaches will shed some light on the problem.

WARFARE IN THE PLANT KINGDOM

by J. W. Sheppard,
M.Sc. '74,
Department of Plant Pathology.

Beneath the peaceful exterior of a meadow of waving grasses and nodding flowers a constant struggle for survival is taking place. Tiny animals move stealthily through the vegetation intent upon killing each other according to the laws of nature. Such behaviour is not restricted to the animal world. The plant world is as rife with contest between individuals and species for survival as is the world of animals. Much of this struggle is invisible, all of it is silent, yet it is a grim warfare without truce, with survival for the victor and death for the luckless loser.

Whenever plants of one species colonize an area, they are liable to be driven out by some other species which has developed a special ability to get the life essentials in that area. The constant battle between lawn grasses and dandelions, between garden plants and weeds are examples of this constant warfare.

The greatest struggle in the plant world is between green plants and the colourless ones — the Fungi. Wherever green plants grow there is a host of fungi lying in wait to feed on them. So well have the fungi equipped themselves for predation upon green plants that there is at least one fungus species for every three flowering plants.

Every breeze brings with it thousands of fungal spores which are the "seeds" of the fungi. The spores lodge on the outside of the plant where they remain unless they find an entry into the living tissues through the bark or the minute breathing pores in the epidermis. The spores germinate into a mycelium of colourless filaments like that of mushrooms.

This mycelium spreads through the plant pushing its way between cells, breaking into the cells, and gaining nutrients from them. As a result, growth of the green plant is often hindered and disease or death usually results. While inside the plant, the mycelium produces more spores which are released at the surface of the host where they are carried away by the wind to wreak havoc in other susceptible plants. When this warfare is extended to those plants upon which we depend — for food, clothing, timber, and other important necessities — the struggle becomes of importance to mankind and we join forces with the green plants. In many cases the cost of battling a single disease runs into millions of dollars.

Fungi can be grouped into classes on the basis of their reproductive habits. One class, the *Phycomycetes*, is composed of fungi with branching filaments without cross walls which produce small spores in unspecialized spore sacs. The common bread mould is an example of a *Phycomycete*. In another class, called *Ascomycetes*, the filaments have cross partitions and spores are produced in a definite number (usually eight) inside a special little sac called an ascus. A third class is the *Basidiomycetes* to which the most common edible mushrooms belong. These fungi produce spores on special portions of the filaments known as basidia. There are also many poisonous members in these groups.

Members of all three classes can produce disease in green plants. A serious disease of potatoes, Late Blight (*Phytophthora*), is

caused by a *Phycomycete*. This disease is a Downy Mildew which gets its name from the downy white masses of spores produced on the surface of the plant by the fungus. Spores enter the plant through the breathing pores of the leaves called stomata. Soon the mycelium enters the cells of the plant stealing life-giving nutrients from the plant. As the cells die, brown areas develop on the leaves and shortly after a fuzzy mass of spore-producing filaments with spores appears on the underside of the leaf. When the mycelium grows in the tubers rotting of the tissues takes place. This disease was so widespread in Ireland in 1845 that a serious famine resulted.

A related Downy Mildew known as the Damping-Off Fungus (*Pythium*) is a menace to young seedlings while other species attack cereals, beets, alfalfa, clover, peas, roses, pansies, and tobacco.

The *Ascomycetes* include about half of the known fungi. Some are useful, such as the yeast, truffles, and morels but in this class are also a number of destructive plant disease-causing fungi.

Diseases caused by *Ascomycetes* include a number of Leaf Curls, Cup Fungi, and Powdery Mildews. The Peach Leaf Curl caused by *Taphrina* changes the normal leaves of peach trees to thickened, curled ones. The bright, ruddy colour of the diseased leaves is very noticeable. Later in the summer the red colour turns to brown as the leaves die, and at this stage the spore masses form a powdery bloom on the surface of the leaves. An estimate of the loss in one year to peach growers as a result

of this disease has been placed as high as \$3,000,000.

The Powdery Mildews (*Erysiphaceae*) form a delicate cobwebby mycelium on the surface of the leaves of green plants which they attack. From this mycelium special filaments project into the leaf and extract nourishment from it. In the reproductive phase of the fungus the filaments form a powdery mass of special reproductive structures in the form of spheres, each provided with ornate out-growths and each containing spore sacs with their supply of spores. The powdery mildews attack fruit trees, roses, strawberries, peas, grapes, grasses, and cereals.

One of the most destructive diseases caused by a member of this class is the Chestnut Blight (*Endothia*). This disease first appeared in New York City in 1904. It soon spread throughout the northeastern United States and into Canada. The estimate of loss of marketable timber and shade trees due to this disease up to 1911 was \$25,000,000. Mute testimony of the destructiveness of this disease can be found in the number of standing, dead chestnut trees still found in the eastern forests.

Among the *Basidiomycetes*, there are two major groups of destructive disease fungi — the Rusts and the Smuts. The Rusts (*Uredinales*) include over 1,000 species. They get their name because of the characteristic appearance of their reproductive bodies which form orange or reddish spots on the surface of the host plant. A peculiar

characteristic of the Rusts is that they usually use two hosts in their life cycle. Often control of the Rusts is based on the eradication of one host resulting in a decline in the fungus.

The Stem Rust of cereals (*Puccinia*) has its alternate host on the wild barberry. The disease has been known since 1797, although references to rusts have been found as early as 1500 B.C. Between 1917 and 1925 this disease was responsible for the destruction of over a half billion dollars worth of wheat. Spores of the fungus, carried by wind over long distances, enter their host through breathing pores on the leaf surfaces. When ready to reproduce, the fungal filaments form several kinds of spores depending upon the host and the time of year. Spores of the fungus produced on the barberry present the greatest threat to cereals as they can survive only if they reach a cereal host. Later in the season, the fungus forms two kinds of spores on the cereal host; one of these types of spores must reach a barberry host to survive.

The Smuts (*Ustilaginales*) get their name from the sooty black masses of spores produced by the fungus. There are over 400 species of smuts which attack cereals and other crops such as onions, spinach, and sunflowers. The fungus like the Rusts consists of branching masses of colourless threads which may invade the entire host plant or may be restricted to certain organs. This disease causes a lowering of vitality of the host which is often stunted and impoverished. Eventually the

mycelium bursts to the surface and forms swellings and tumours containing the spores. Unlike the Rusts, there is no alteration of hosts in the Smuts.

These are but a few of the combatants in the constant warfare within the plant world. Not always a pleasant picture but an important aspect of plant life which cannot be ignored.

Q.F.A. Annual Meeting

The Annual Meeting of the Quebec Farmers' Association will be held at the Centennial Centre, Macdonald College, Ste. Anne de Bellevue, on October 8, 1974.

The business meeting, which will include annual reports and elections, will begin at 10:30 a.m., and will be followed by a luncheon.

Guest Speaker, at 2 p.m., will be Gaétan Lussier, Deputy Minister, Department of Agriculture, Quebec. His topic will be Agricultural Land Use Zoning, an issue presently under study by the Ministry of Agriculture and of concern to the agricultural community in Quebec.

Members of the Q.F.A. are urged to participate, and prospective new members and other interested people are cordially invited to attend.

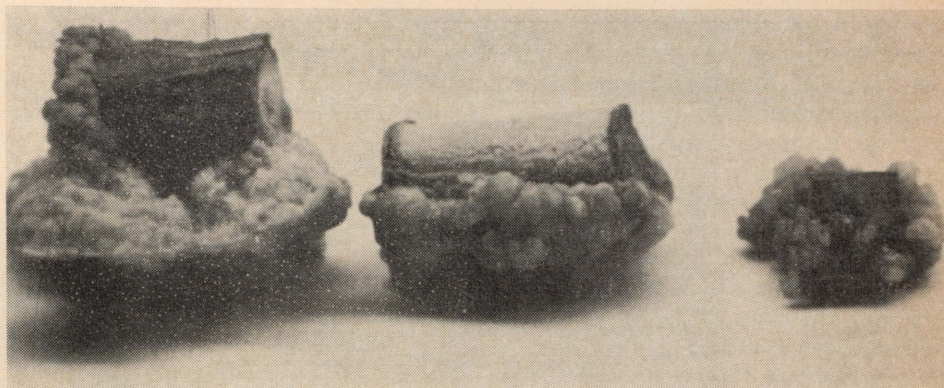
Agriculture in a Test Tube

by Robert Coffin, M.Sc.'74,
Department of Horticulture

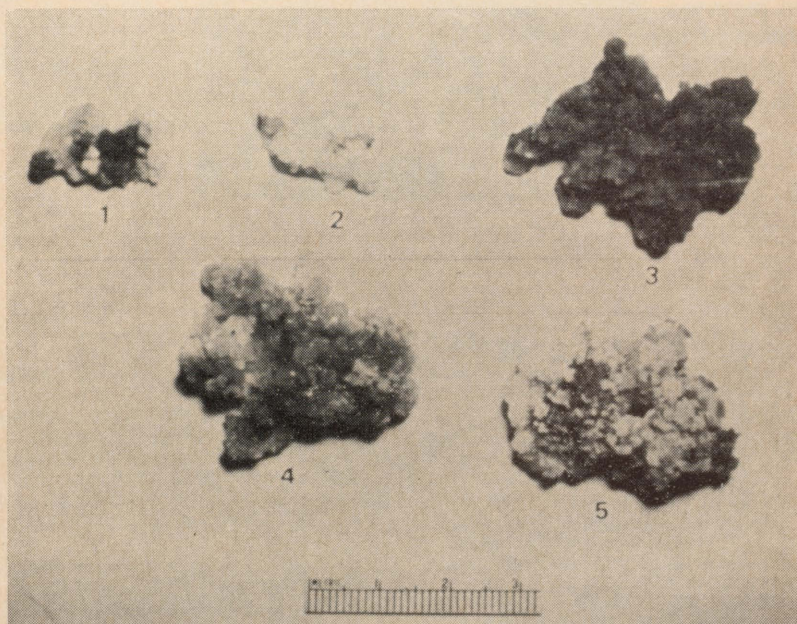
Many plants and animals may be broken down into their structural and functional parts, such as cells, tissues, and organs, without destroying their ability to survive or grow as integral living units. The technique of plant tissue culture involves the removal of these living units from a parent plant and growing them under sterilized conditions in the laboratory. Now that scientists can grow and study these living units in test tubes, the tissue culture technique has opened up numerous possibilities in scientific research. This technique has recently become an important tool in agricultural research.

This brief article describes various plant tissue cultures and emphasizes some applications for which they are presently employed in agriculture. Further information may be obtained by referring to Butenko (1), Carew and Staba (2), Gautheret (7), and Mandel (8).

Tissue cultures derived from a wide range of plant materials can be grown for an indefinite period of time on completely artificial or synthesized nutrient medium. An isolated piece of tissue grown on jelly-like nutrient medium normally develops into a clump of cancerous-like growth termed a "callus" (Figures 1-3). When removed and re-cultured in liquid medium within a shaking flask, the callus separates into single cells (Figure 4). This latter modification is referred to as the technique of cell suspension culture. The culture of plant cells in suspension is similar in several ways to the culture of microorganisms but growth of plant cells is much slower.



Above: Figure 1. Formation of callus tissue on stem sections of fruit tree. Below: Figure 2. Callus tissues of (1) plum, (2) pear, (3) wild cherry, (4) sweet cherry, and (5) sour cherry. Each tissue differs in colour, texture, and growth habits.

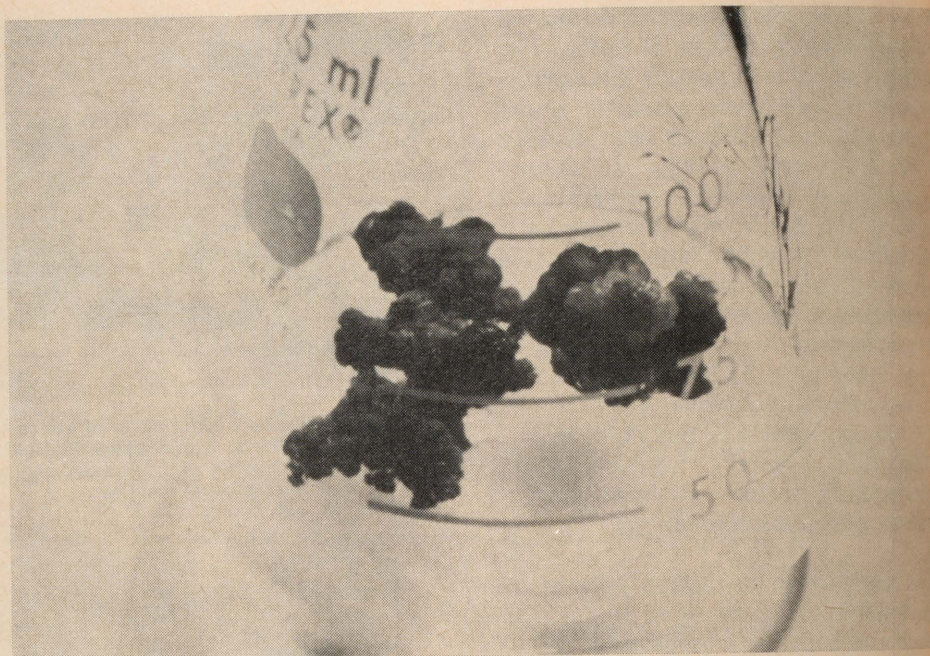


Tissue cultures have different uses in the study of plant diseases. For instance, the successful culturing of uninfected stem tips of plants infected with virus diseases can result in the production of virus-free plants. Bacteria, fungi, or nematodes also are cultured in the presence of plant tissue cultures

to investigate host-pathogen relationships. Similarly, tissue cultures can be a useful tool to test new herbicides and pesticides for harmful effects on plants.

Above: Figure 3. Good growth of peach callus on a completely defined medium. Below: Figure 4. An apple cell cultured in suspension is similar in appearance to bacteria but much larger in size.

The culture of plant cells as a source of human food has not yet been feasible. Although large yields of cellular material have been obtained, the cells in culture contain little if any extra food value that was not previously present in the culture medium. In nature, green plants produce large amounts of food by photosynthesis but most cell cultures cannot undergo photosynthesis and hence are not self-sufficient in the production of carbohydrates. Carbohydrates must be added to the medium to support growth. Recently, a cell culture capable of self sufficiency has been reported (4). The further development of such self-sufficient



photosynthetic cultures may contribute to man's food supply. In some instances tissue cultures are used for the production of rare and/or expensive medicinal plant products, which are produced as a by-product of their growth under artificial culture condition. The study of plant tissue cultures has greatly assisted in a better understanding or discovery of chemicals such as growth regulators.

Cell cultures derived from the same plant may or may not have the same morphological appearance and biochemical potential; however, such differences may be valuable for genetic studies and plant breeding.

Figure 5. Apple callus which has formed roots.

The most recent advance in plant breeding by tissue culture was the fusion of two single protoplasts (wall-less cells obtained by adding chemicals to the medium) each from a different species of tobacco and the subsequent formation of a plant which was an interspecific hybrid (3). With further research, significant advances in genetic engineering and the production of "synthetic plants" will be forthcoming.

Probably, the most revolutionary use of plant tissue culture has been the development of improved plant cultivars without the actual involvement of the mechanism of sexual crossing (9). Under controlled cultural and nutritional conditions, single cells and/or callus may be induced to form roots (Figure 5), shoots and/or develop into complete plants. The plants thus formed may have a new genetic make-up. Using this procedure new varieties of tobacco, sugar cane, rice, and alfalfa have been developed. Pollen grains (haploid cells) have similarly been induced to develop into plants that can be more appropriately termed "plants without mothers" (11).

Presently, plant tissue culture is being used in several departments at Macdonald College for many purposes: the Genetics Department is attempting to obtain haploid alfalfa and trefoil plants for breeding purposes (10); the Plant Pathology Department is culturing nematodes in the presence of plant tissues for pathological investigations, and the Horticulture Department is studying the carbohydrate metabolism of fruit trees (5, 6).



References

1. Butenko, R. G. 1964. Plant tissue culture and plant morphogenesis. Edited by Chailakhyan, M.D., Acad. Sci. U.S.S.R. (Eng. transl., 1968, by Artmann, M., National Science Foundation, Washington, D.C., pp 291).
2. Carew, D. P. and Staba, E. J. 1965. Plant tissue cultures: its fundamentals; application and relationship to medicinal plant studies. Lloydia 28:1-26.
3. Carlson, P. S., Smith, H. H. and Dearing, R. D. 1972. Parasexual interspecific plant hybridization. Proceedings of the National Academy of Sciences, (U.S) 69:2292-2294.
4. Chandler, M. T., de Marsac, N. T. and de Kouchkovsky, Y. 1972. Photosynthetic growth of tobacco cells in liquid suspension. Can. J. Bot. 50:2265-2270.
5. Chong, C. and Taper, C. D. 1972. *Malus* tissue cultures. I. Sorbitol (D-glucitol) as a carbon source for initiation and growth. Can. J. Bot. 50:1399-1404.
6. Chong, C. and Taper C. D. 1973. The influence of light intensity on sorbitol metabolism growth and chlorophyll content of *Malus* tissue cultures. Ann. Bot. 38: (March issue).
7. Gautheret, R. J. 1959. La culture des tissue végétaux, Masson et Cie, Paris. pp 863.
8. Mandels, M. 1972. The culture of plant cells. Adv. Biochem. Eng. 2:201-215.
9. Nickell, L. G. 1973. Test tube approaches to bypass sex. Hawaiian Planters' Record 58:293-314.
10. Niizeki, M. and Grant, W. F. 1971. Callus, plantlet formation and polyploidy from cultured anthers of *Lotus* and *Nicotiana*. Can. J. Bot. 49:2041-2051.
11. Nitsch, J. P. 1971. Les plantes sans mères. La Recherche 2:523-529.

The Family

Farm

Published in the interests of the farmers of the province by the Quebec Department of Agriculture

At the International Salon of Agriculture

"C'est Donc Bon!" Theme of the Quebec Department of Agriculture's Information Stand

Once again, the Quebec Department of Agriculture will be taking part in the International Salon of Agriculture and Food which will be held this year from October 29 to November 3 in Place Bonaventure, Montreal.

The agricultural ministry's stand will feature Quebec farm produce with the theme "C'est donc bon!", in witness whereof visitors to the stand will see displays of Quebec-grown vegetables, maple products, apple by-products, cider, honey, etc.

One section of the stand will be devoted to holidays on farms and those interested will be able to find out all they want to know there about the Department's programs in this connection.

Cooperating with other organizations through its various branches, the Department will also draw the attention of the public to progress and achievements in the agriculture and food sector. For example, the livestock productions division will exhibit specimens of all the different kinds of animals commonly kept on Quebec farms, and the marketing branch, in collaboration with various agricultural producers' groups, wholesalers and manufacturers, will display Quebec products.

Through its Exhibitions division, the Department is setting up a stand for the "Farming Family of the Year"

Foundation. This will feature photographs of Quebec's leading farming families over the past 20 years.

The dairy and meat products inspection service of the Department is arranging for prizes to be distributed on November 1 at the Salon to owners of milk processing plants who have won first place in their field for improving the quality of dairy products and thereby contributing to the health and satisfaction of consumers.

From October 29 to November 3, 1974, Place Bonaventure should thus be a Mecca for all farmers and for the population in general. As an added attraction, visitors to the Department's stand may win a trip for two to Paris in March 1975 to visit the International Salon of Agriculture there.

IMPORTANT FOOD AND AGRICULTURE SYMPOSIUM

A symposium on the challenge to feed itself which faces the world will be held on Thursday, October 31, at the Salon of Agriculture and Food in Montreal.

Research workers and food specialists taking part in the symposium as speakers will deal with a number of topics, as follows:

- Food and inflation;
- Marketing during the inflationary period, by Mr. Gérard Virthe, executive vice-president of COGEM Inc., and head of the

Food and Marketing section of the Business Faculty of the University of Sherbrooke;

- Synthetic foods and their nutritional value, by Dr. René Riel, professor in the Food Science department of the Faculty of Agriculture and Food at Laval University;
- Government surveillance of foodstuffs, by Monique Saint-Hilaire of the National Food and Drug directorate's educational Service;
- Food surveillance within the industry, by Armand Bélanger, head chemist for Canada Packers at Montreal;
- Consumers' associations;
- Quebec's self-supply policy, by Mr. Gaétan Lussier, Deputy Minister of Agriculture of Quebec.

Members of the public seeking further information about the symposium should contact the chairman of the organizing committee, Professor Benoit Marcil of the St-Hyacinthe Institute of Agricultural Technology.

La Pocatière Institute of Agricultural Technology Features Its Horse Option

The La Pocatière Institute of Agricultural Technology will participate in the International Salon of Food and Agriculture with a view to informing the public about its role in Quebec agriculture and, in particular, about the equine technology option it has been offering its students since September 1973.

In this connection, instructors and students from the Institute will give demonstrations of English and Western riding methods.

Amongst other things, they will explain how to approach, caress, brush, saddle, bridle and mount a horse, and how to lift its feet. They will also show how to hold the reins, start, turn, trot, and gallop. In addition there will be demonstrations of gaits and figures such as the volt (moving sideways in a circle) and demi-volt.

Besides these demonstrations, those responsible for the program have arranged for an information booth where a videotaped description of the course given to the Institute's students and practical demonstrations of equine technology will be screened.

All visitors to the Salon are cordially invited to come to the Institute's stand and see the demonstration of horsemanship.

Quebec's Farm Animals Will Be There

All of the different kinds of animals commonly kept on our farms will be on display at the Quebec Department of Agriculture's stand.

Thanks to the agricultural department's livestock productions branch, visitors to the show will be able to get a close look at 30 head of beef cattle (Hereford, Aberdeen-Angus, Shorthorn, Charolais, and Limousin), around 10 head of dairy cattle (Holstein, French-Canadian, Ayrshire, and Jersey), 8 sheep (Suffolk, North-

Country Cheviot, Oxford, and Dorset), 10 horses (Quarter Horse and French-Canadian), 10 ponies and a Canadian Breweries team. Also on display will be a Yorkshire sow and her litter of piglets and various small farm animals including hens, ducks, geese, and rabbits.

During the inter-breed judging competition, a specialist will describe each breed of livestock and discuss its origin and development in Quebec and elsewhere in the world.

Among other features of the Salon will be talks on the nature and quality of different meat cuts with a live animal to show what part of it they come from, sale of "brioches à l'agneau" to promote consumption of Quebec lamb and an information booth with a score of posters depicting a farmer's life.

Briefly, the efforts of the Quebec livestock branch at the Salon are designed to tell the consuming public about the various government programs for improving and promoting the above-mentioned kinds of livestock.

PROMOTION OF SWINE PRODUCTION (Health Program)

Eligibility: All swine raisers who meet the requirements of the breeding program are eligible for the health program.

RULES AND CONDITIONS

The beneficiary must:

1. submit an application to the

director of the Veterinary Service;

2. satisfy minimum standards as regards premises and equipment and herd management, fulfilment of these requirements to be judged by veterinarians responsible for herd surveillance;

3. Undertake to:

- a) keep a complete record of births, deaths, and sales of all pigs born on his farm;
- b) limit his purchases to pigs from herds at least as healthy as his own;
- c) allow the authorized veterinarian to make all necessary inspections and give him all information required;
- d) strictly carry out the veterinarian's instructions concerning a health program for herds.

BENEFITS: The Department of Agriculture provides the following assistance to help breeders meet the requirements of this provincial program.

TECHNICAL AID: Permanent veterinary personnel of the Department will make health surveillance visits.

Distribution of copies of reports drawn up on form SVP-2: The original will be sent to Dr. Jean-Baptiste Phaneuf, Box 5,000, Saint-Hyacinthe, who is in charge of the program. The first copy will be sent to the Veterinary Service. The second copy will be left with the farmer. The third copy will be kept by the visiting veterinarian.

AID FOR DISEASE CONTROL

- a) Compensation for slaughter or isolation at the rate of \$25 per swine unit will be paid if, in the opinion of the director of the program, a disease cannot be controlled otherwise. This compensation is restricted to breeding stock;
- b) The Department may buy and have shipped at its expense at prevailing market prices, in Quebec or elsewhere, sows really suitable for obtaining piglets by Caesarean section or hysterectomy;
- c) The Department will pay the cost of surgery to deliver piglets from such sows. It will also pay the cost of the sow's maintenance before and after the operation;
- d) Breeders who are interested may obtain piglets from these sows by reimbursing the Department as follows: Piglets turned 2 months, \$50; turned 3 months, \$75; turned 4 months, \$100; turned 5 months, \$125; turned 6 months, \$150.

AID FOR DIAGNOSIS AND RESEARCH: The Department will pay a grant of up to \$7 to abattoirs for selling and delivering to a laboratory the head and lungs of each animal requiring examination under this program. The bill, signed by the director of the program, will be accepted as grounds for payment of the abattoir's claim, which will be payable at any time.

AID FOR CROP PROTECTION

(Saguenay-Lake St. John)

Agricultural production in the Saguenay-Lake St. John region is mainly centred on cattle raising,

the profitability of which partly depends on crop yields. These yields can be appreciably increased if losses caused by insects and fungus diseases and competition from weeds can be reduced. This means that the use of insecticides, fungicides, and herbicides and of suitable sprayers to apply them with is called for.

In order to promote adequate crop protection and in view of the inadequacy of the presently available means, the Quebec Department of Agriculture, under the Arda III Agreement, grants financial aid to Farm Services Cooperatives and Farm Machinery Syndicates buying a new sprayer and meeting the requirements hereinafter described. This program will be in force during the 1974-75 and 1975-76 fiscal years.

1. AIM

To make sprayers available to farmers so that they can give their crops better protection and thus obtain bigger and better-quality yields. The program is also designed to promote more judicious use of pesticides.

2. FINANCIAL AID

To Farm Services Cooperatives and Farm Machinery Syndicates which agree to participate in this program, the Quebec Department of Agriculture will reimburse 50 per cent of the price paid when they buy a sprayer. The maximum grant per sprayer is \$600.

3. TERMS AND CONDITIONS OF ELIGIBILITY

A. Beneficiaries

- a) The sprayer must be bought by a Farm Services Cooperative or Farm Machinery Syndicate;
- b) A Farm Services Cooperative which takes advantage of this grant must agree to lease the purchased sprayer to the farmers in the territory it serves;
- c) The buyer must undertake to keep the sprayer for three years. If it is disposed of within that time, 75 per cent or 50 per cent or 25 per cent of the grant must be repaid (depending on whether the sprayer is sold after it has been used for one, two, or three years);
- d) Beneficiaries must agree that the use of the sprayer shall be subject to surveillance by officials of the Quebec Department of Agriculture.

B. Equipment

- a) The sprayer must be equipped with a 100-gallon spray tank;
- b) It must also have a device for suiting the pressure to herbicide, insecticide, or fungicide spraying.

4. HOW TO APPLY FOR THE GRANT

Farm Services Cooperatives and Farm Machinery Syndicates wishing to take advantage of this program must apply to their local agronomist and use the official form supplied to them.

5. PAYMENT OF THE GRANT

Payment will be made upon presentation of dated vouchers bearing the description of the purchased sprayer with the following details: maker, model, type, capacity

of spray tank, type of pump and of agitator, and width of spray boom.

Subsidized Farm Labour

In several sectors of Quebec's economy, including agriculture, there is a serious labour shortage even though many workers are seeking employment and having to receive welfare.

One of the chief reasons for this state of affairs is that, because of their narrow profit margin, employers in certain sectors cannot pay attractive enough wages. This is especially true of farmers in some of the more labour-intensive branches of agriculture where wages are a large part of production costs.

In order to create jobs and provide farmers with the help they need, the Quebec government, through its Department of Agriculture, offers to help pay the wages of persons in certain categories who agree to work in agricultural production.

A. FINANCIAL AID

The Minister of Agriculture will pay eligible employers 75 per cent (up to a limit of \$85 a week and \$2,500 per 30-week year, per man) of the wages paid to every employee hired during the 1974-75 fiscal year (April 1 to March 31) over and above the number hired in fiscal year 1972-73. The maximum amount of

subsidy a farmer may receive under this program in a year is \$10,000.

B. BENEFICIARIES

Any employer in the production phase of agriculture whose labour requirements for operating his farm are more than he and his family can normally satisfy and who agrees to hire one or more eligible workers and pay them a minimum wage of \$2.75 an hour. Workers hired must be welfare recipients or marginal farmers.

The following may also qualify as employers on the same terms and conditions: duly constituted cooperative agricultural production associations and agricultural production corporations.

C. MARGINAL FARMER:

For the purpose of these regulations, a marginal farmer is considered to be a farmer who, operating his farm normally, cannot derive from it sufficient net income to meet his needs and those of his family.

A person may also qualify as a marginal farmer if, on January 1, 1973, he owned and operated a farm which he has since sold under the small farms development program.

The Department of Agriculture's local representative will determine whether a marginal farmer is eligible.

D. DURATION OF EMPLOYMENT:

To obtain this assistance, the employer must provide an eligible worker with continuous employment for at least eight weeks; an

exception may be made in the case of workers engaged by market gardeners (horticulturists), apple growers and maple syrup producers, in which event the minimum period of employment required will be only three weeks.

E. INFORMATION, APPLICATION, AND PLACEMENT:

Any worker or employer who wishes to obtain further information or make application under this program should apply to the Department's local representative. If the employer is deemed eligible he may proceed to engage workers qualifying for the categories mentioned in "B" above by going to the nearest Quebec Manpower Centre or Social Aid Office and submitting the names of eligible workers he wants to hire. Preference will, however, be given to workers receiving welfare payments.

F. CLAIMS

To obtain the reimbursement of part of the wages paid, the employer must apply to the Department's local representative, using the forms with which he will be provided and producing the information and documents required. The first claim may be submitted at the end of the minimum employment period mentioned above (eight weeks). Subsequent claims may be submitted once every two months.

G. SPECIAL PROVISIONS:

When submitting his claim, the employer must produce proof that he has complied with the acts and regulations concerning social

security (unemployment insurance, health insurance, pension plan) and income tax. To help him do so, the Department of Agriculture places at his disposal an explanatory folder and the necessary forms; further information may also be obtained from the ministries concerned.

Development of Unused Farmlands

In the Abitibi-Témiscamingue region, the Quebec Department of Agriculture has launched various programs designed to encourage grain growing, cattle raising and other farm productions, with the object of making Quebec more self-sufficient and keeping suitable land in agriculture.

A fairly large acreage of soil having good agricultural potential in this region is at present lying idle. It is land belonging to farmers who are too old to work it or who are employed in other sectors, or farms which have been bought up under land reorganization programs, etc.

This farmland should be used for agricultural productions suited to the region but, if it is to yield well, it should first be improved. However, in many cases, individuals or groups able to work such land do not have the means to bring it back into production.

Immediate Aim: The immediate aim of the present measure, which is being implemented under the Arda III agreement, is to provide farmers or farming groups, recognized by the Department, with the financial means necessary to bring neglected farmland back into production for growing grain, forage, oilseed crops, etc.

Financial Aid: The financial assistance offered under this program is payable once only, at the rate of \$15 per acre of presently unused farmland which is to be improved and brought under cultivation in accordance with a program approved by the Department.

Requirements: To be eligible for this policy, beneficiaries must carry out the operations needed to bring under cultivation land having good agricultural potential in accordance with a cropping plan approved by the Department.

Beneficiaries: Agricultural producers, farming partnerships and corporations, and any other groups recognized by the Department.

Operations Needed To Bring Land Under Cultivation: For the purposes of this program, the following are considered to be operations needed to bring land under cultivation: ploughing, harrowing, liming, fertilizing, and seeding.

Unused Farmland: Any land having good agricultural potential, as determined by the Department's representative, and from which no crop has been harvested during the two growing seasons preceding the application.

Application: The farmer or the secretary of a group qualifying for this subsidy must submit an application to the Department's local office and have the improvement and cropping program approved before the work is begun.

Payment: The subsidy will be paid following inspection of the work by the Department's representative and upon his recommendation.

Date Effective: This program became effective on April 1, 1974.

High-Moisture Corn 1974

The Quebec Department of Agriculture wishes to make high-moisture corn grown in southern Quebec equally available to all farmers in the province.

This policy is designed to relieve corn growers of the temporary surpluses that distort the market at harvest time, ensure them of better prices, save them drying costs, and enable them to make direct sales (thus eliminating profits to intermediaries).

The Department will pay financial assistance for the transportation of high-moisture corn. This subsidy will be based on the amount by which the rate exceeds \$3 a ton and will be limited to the following maxima:
Regions 2 (Quebec), 3 (Beauce) and 5 (Sherbrooke) . . . \$3/T
Regions 1 (Rimouski), 9 (Noranda) and 12 (Saguenay-Lake St. John) . . . \$8/T.

Excerpt From the Agriculture Department Act:

Article 18a Every person who makes a false declaration to obtain a grant, advance or security for a loan contemplated by this act or an amount payable as assistance under a plan, program or project, commits an offence and is liable for the first offence to a fine of \$500 and, for any subsequent offence within two years, to a fine of \$1,000.

Proceedings under this section are taken under the Summary Convictions Act (Chap. 35) and Part II of that act applies thereto.

QWI

This Month with the



Members of the F.W.I.C. Board where invited to the Prime Minister's residence for coffee. From left to right, QWI President, Mrs. J. W. Westover, Mrs. Margaret Trudeau, and 1st Vice President Miss E. Smith.

F.W.I.C. BOARD MEETING

The Federated Women's Institutes of Canada's 13th Annual Board meeting was held in the beautiful atmosphere of Carleton University, Ottawa, on June 18 - 20, 1974. The National President Mrs. John McLean gave an interesting report of a very busy year. There were 42 at the meeting from across Canada.

Mrs. R. V. Jamieson, National Secretary-Treasurer, announces a total membership of 54,604, with 485 Junior members and 600

French-speaking members.

Mrs. McLean will head the Canadian delegation at the A.C.W.W. Conference in Perth, Australia, in October, 1974. Mrs. E. V. Fulton, past president, Mrs. A. Zoeller, Mrs. J. Bielish, vice-presidents, Mrs. C. L. Alexander, officer-at-large, and Mrs. G. W. White, United Nations and International Exchange Convener will be the other F.W.I.C. voting delegates. The Federated Women's Institutes of Canada will present \$1,000 to the A.C.W.W. Pennies for Friendship.

The Adelaide Hoodless Rose has been released in honour of the founder of the Women's Institutes. One has been planted at the Adelaide Hoodless Homestead and one at Mrs. J. McLean's home. By 1975, these roses should be in good supply.

The cost of group subscriptions (10 or more to one address) was raised to 50 cents and all subscriptions should be sent to National Office by December 15 of each year.

Each constituent society is to pay \$25 a year towards the expenses

of the Area Vice President of Canada. The F.W.I.C. fees are to be raised to 50 cents per member.

There is to be another Provincial membership competition for percentage increase in membership from April 1/73 to April 1/76.

Much work and time was spent in updating the F.W.I.C. bylaws. Next year will be International Women's Year. Mrs. McLean has asked for ideas and film on F.W.I.C. She requested that all provinces focus in on the fact that it is International Women's Year and let her know of plans so she can pass them on at any time. The next National Convention is to be held at the University of P.E.I. on June 17-25, 1976 and the next Board meeting in Ottawa, June 17-19, 1975.

After Mrs. McLean declared the meeting officially adjourned, we were taken by bus to the Residence of Prime Minister and Mrs. Trudeau for an 11 o'clock coffee party. We were graciously received by Mrs. Trudeau and all enjoyed the honour of being guests at 24 Sussex Drive. Pictures were taken on the beautiful grounds with Mrs. Trudeau.

Miss Edna L. Smith,
1st Vice President,
Quebec Women's Institute

Members' Conference

Gaspé County held a very successful Members' Conference on June 27. The morning session was held in the hall in York with seven branches represented. A total of 45 members were in attendance. After we had all registered, Mrs.

Westover opened the Conference with O Canada and the Creed. Mrs. Westover spoke of the meaning of the Creed, then welcomed all to the meeting, which she hoped the members would find interesting and helpful. She asked that all take a part in it. We both expressed our pleasure at being able to be there.

The members were divided into discussion groups and each group appointed a secretary and brought back their findings. They all felt that there is a great future for Quebec Women's Institutes, that we should put more emphasis on the needs of the community by contacting the right people about roads, signs, and keeping our country beautiful.

In order to encourage our young people to join we should have a social evening occasionally, invite them to attend and take part and in this way create interest.

Suggestions to make meetings more interesting were: stick to business and do it all in the meeting, make meetings short and interesting, discuss motions thoroughly before taking a vote, each convener have a short article and have guest speakers or films.

It was felt that get-togethers should be arranged with our Senior Citizens. We should call on them, read, do errands and, when they are able, take them for a drive or possibly to a W.I. meeting. Many are very lonely. Try to organize a Senior Citizens' Club. Mrs. Westover adjourned the meeting and we were driven to Wakeham where we enjoyed a buffet lunch and the afternoon meeting was held.

The members led in a sing song and Mrs. Baird expressed thanks on behalf of the county to us for going to Gaspé and presented us with a souvenir for which we thanked them sincerely.

Mrs. Cascadden our Provincial Treasurer had prepared a chart for us so that we could explain where the member's dollar was spent. The members always find this interesting. Other subjects were: Q.W.I. Service Fund which is to be sent in November of each year; the Macdonald Journal; Food for the Hungry Fund; Adelaide Hoodless Rose, W.I. Day on October 31 at the International Salon of Food and Agriculture, Place Bonaventure, Montreal, the Drama Competition, and Expo-Quebec.

The members showed much interest and asked many questions relevant to W.I. work and said that they had found the Conference very helpful and that the contact with the Executive was good as they miss our annual visits.

Mrs. Westover and I both appreciated the warm welcome we received and also enjoyed the beautiful scenery. Owing to the bus strike in Montreal we had to fly from Montreal to the Gaspé, but we were able to make the return trip by bus. Many thanks to the kind ladies in Gaspé County for making our visit so pleasant.

Miss Edna L. Smith,
1st Vice President,
Quebec Women's Institute

A Trip Into the Past

Several members of the Cowansville WI (Missisquoi Co.) motored to



Members of the F.W.I.C. Board with Mrs. Margaret Trudeau.

Knowlton in August and visited the Brome County Historical Society Museum.

Upon our arrival, we were welcomed by the Curator, Miss Marion Phelps and then taken on a tour of the Museum with Mrs. Mary McCutcheon as our guide and narrator. Two student workers, Miss Lynn Matthews and Miss Lynne Eaton, also assisted in escorting the members through the buildings. Much interest was shown in the various items on display and many questions were asked concerning the articles.

As a group, we feel that we are indebted to those who are working at the present time to preserve these treasures of the past and we pay tribute to those who, in years gone by, had the foresight and sense of history to form a society whose object was to preserve these articles for future generations to enjoy.

A picnic lunch was held in the main room of the Centennial Building, and tea was served most graciously by the two student assistants.

Following lunch, we visited the "Old Fire Station" which is part of the Museum complex where we viewed hand-forged iron, leather articles, natural history exhibits as well as the farm museum. We then gathered on the lawn for a social hour during which

Mrs. John Syberg, a member of the Fordyce Branch, passed around wedges of fresh pineapple which she and her husband had brought back with them from their recent trip to Hawaii. This brought to a close a very enjoyable outing.

Tomato Butter

- 10 pounds ripe tomatoes
- 6 large tart apples — peeled, cored, and chopped
- 3 onions — chopped
- $\frac{3}{4}$ quart vinegar
- $3\frac{1}{2}$ pounds brown sugar
- $\frac{1}{4}$ teaspoon red pepper
- 1 tablespoon of each — cloves, cinnamon, allspice and salt.

Blanch the tomatoes and remove skins. Put all ingredients, except sugar, in a pan and simmer gently until apples are soft and mushy. (If the sugar is added at the beginning, the apples stay hard.)

Add sugar and cook till thick and rust coloured. Stir frequently to prevent burning. Pour into hot, sterile jars and seal at once. Serve with cold meats, etc.

Cucumber Pickle

This is a cucumber pickle that does not contain vinegar.

Use a gallon-sized container with a tight lid, i.e; glass or plastic.

In bottom of container put:
 $\frac{1}{2}$ cup pickling salt (non-iodized)

- $\frac{1}{2}$ cup pickling spice + 3 hot chili peppers
- $\frac{1}{2}$ head garlic — peeled and chopped
- 1 sprig dill (in flower and include stems, leaves, and flower)

Fill the jar with small to medium cucumbers, firmly stacked. Pour cold water to cover completely and cover tightly. Stand at room temperature or in a sunny window for 3-5 days, until fermentation is working well. Open jar and allow foam to pour out and then top up with cold water. Cover tightly again and leave for a further 5 days. Open and test for desired flavour and texture. The longer they are left, the softer they become and the more salty. When ready to suit, put in a cool place (basement or fridge). Always be sure the water covers the cucumbers completely. If no small cucumbers are available, use medium sized ones and split them into $\frac{1}{8}$ (eighths). These will process more quickly than the whole ones.

Dear W.I. Members;

From all accounts you have had a busy summer. Gardens have been good in most places and freezers are filling fast. Please remember your contributions for the "Food for the Hungry Fund".

Some of you didn't have summer meetings and others combined them with picnics or tours. One branch met at a member's summer home

and answered the Roll Call by entertaining the others with jokes, stories, and poems. They had to identify pioneer tools and give the derivation of surnames.

Dunham had a social evening for members, families, and friends.

Howick invited another branch and had a 'Show and Tell' Roll Call on an article of historical interest, followed by a panel discussion on the history of Alan's Corners where the Battle of Chateaugay was fought in 1813.

A report came from **Shipton** on a late spring tour to two paper mills, one of which is over 100 years old. A member from this branch had been conducting a class in the school on Artex roll — on decorator paint and found it an interesting and rewarding experience.

Tours included a visit to the Trapp family lodge in Vermont; a trip to Old Fort Henry at Kingston with a visit to Sir John A. Macdonald's old home and a boat tour of the Thousand Island area which was much enjoyed by all.

One member had been on a Caribbean cruise on the Queen Elizabeth 2nd, and she described the ship and the places she had seen. Another member had attended a W.I. County meeting in England and been given a very warm welcome.

Restigouche heard a talk and saw slides on Spain by a student who had been there. Another student spoke on a trip to Ottawa.

Anniversaries are still being celebrated. Congratulations to **Pioneer** on its 60th Anniversary.

Representatives from Argenteuil County attended and all report having a good time. **Matapedia** celebrated their 20th. Anniversary. Their cake was donated by the **New Richmond** branch and flowers came from **Grand Casapedia**. They report sending stamps to Australia.

Frontier branch received a thank you from Australia for picture postcards sent with recipes on them.

Making quilts seems to be a popular pastime and both **Dennison Mills** and **Restigouche** report having completed one and sold it for funds and both are working on another. With so many doing quilting, this might be a chance for QWI to enter one in the Tweedsmuir contest in 1976. Get in touch with your Home Economics Convener for details.

Marcil has been presented with a book "Our Natural Heritage" by a W.I. in England. They presented a trophy to the school, made a donation for prizes, and heard Mr. Loftus speak on "Communications" — television and radio.

Port Daniel had a display of cook-books, some from W.I. groups in other provinces, with a brief history on each. They are enjoying trying out the recipes in the Journal.

We were happy to hear from our new branch on **Grosse Isle** in the Magdalen Islands. In July, Mrs. Lillian Irwin, whose husband works for Indian Affairs, spoke on Indian Handicrafts and showed some bead work. In August, they heard Mrs. Gould, of Newton, Mass., speak on her 29 years as a teacher of educable mentally

retarded children.

We always enjoy demonstrations. If we learn to make something new, this is fun and if we can learn to give a new lease of life to an old article, this is better. One branch learned how to repair lawn chairs, using coloured nylon strips and weaving new seats and backs. Styrofoam egg cartons can be turned into many useful and decorative articles, but care should be taken to keep them away from an open flame.

A recent guest speaker at **Aubrey-Riverfield** was the Rev. Alex McDonald. He spoke on the rural church and community and stressed the need for responsible leadership especially where young people are concerned. Giving of one's time and talents is more important than just giving money. Mrs. Clark, ex-Publicity, has been a guest speaker at **Upper Lachute**. She spoke on some of her experiences as Publicity Convener.

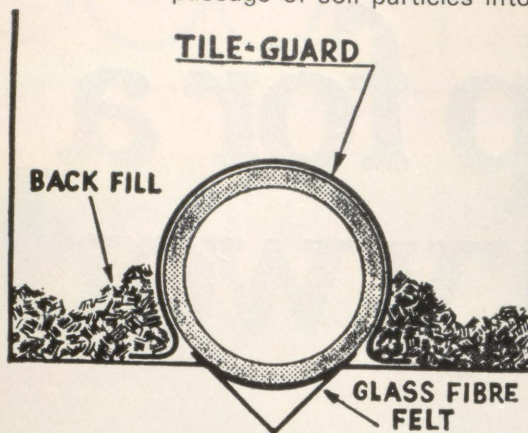
I would like to pass on some Roll Call ideas that have come in. Have an exchange of recipes; name a spice and its use; tips on road safety and tips on the prevention of food poisoning; bring in a poster that represents W.I. in some way.

Here are some contest ideas. Have a spelling bee on words used about the home and its activities; unscramble jumbled words of things used on the farm; have a quiz on provincial flower emblems or flags, or one on provincial capitals.

Mrs. Anne Robertson,
Q.W.I. Publicity Convener.

NOW ... Prevent FARM DRAINAGE TILE CLOGGING With "Tile Guard" and "Glass Fibre Felt"

"Tile Guard" Drainage Tile Cover is a web-like mat composed of inert glass fibres made of materials specifically compounded to withstand underground alkalis and acids. It is virtually ageless, and effectively retards the passage of soil particles into the tile.



Why use 6" when 4" will do with Tile Guard and Permits use of smaller tile.

GLASS FIBRE FELT
For Under Support
and Protection
in Unstable
Soils

MR. FARMER: Discuss your problem with The County Agricultural Representative or Extension Specialist. For complete information at no obligation write or telephone collect to:

GLOBE GLASS SATURATORS LIMITED

Manufacturers of Glass Fibre Roofing Products and Tile Guard
P. O. BOX 190 PETROLIA, ONTARIO DIAL 882-2300
or Request Material from Your Drainage Contractor.

INSECT PROBLEM? Use an Aero-Dyne INSECT FOGGER



Don't let insects take the joy out of outdoor living. Fight flying insects with the original, self-contained portable insect fogger. NO method is more economical! You treat the whole area with a thick insecticide-carrying fog. NO residue or unpleasant odors.

Model 500 Insect Fogger
Retail Price Only \$49.95 Prepaid.
Check or money order in U.S. Dollars.

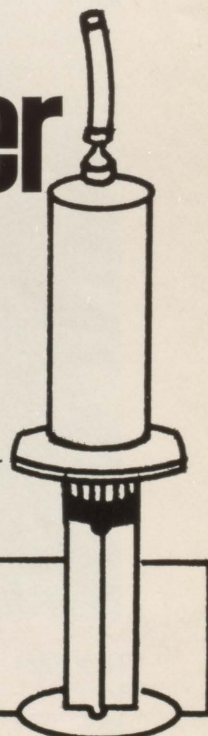
Dealer inquiries invited.

R. PHILIP BERMAN, ESQ.,
& ASSOCIATES LTD.,
480 Lefferts Avenue,
Brooklyn, New York, 11225.
Tel.: (212) 772-8539

Shur-Gain Protection

dial doser

A superior formulation for use as an aid in the treatment and control of baby pig scours. Contains Bacitracine, Streptomycin and other essential ingredients. Conveniently dispensed through a Dial Doser for accuracy and minimum waste.



dial doser

available at your Shur-Gain Dealer

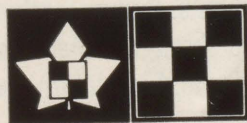
Help for a hungry world

Earth's appetite grows daily — and with it the need for ever more efficient use of food resources.

At Ralston Purina we believe our agri-products and programs are helping. We're active in many areas that have better foods, more foods and better production methods as their goals.

For example: research into new protein systems. Advice, counsel and arrangement to farm and stock operators around the world. Assistance to private sectors in agri-business. Development of low cost, high nutrition human foods.

We're working on many of the problems you'll be encountering as an agrologist. And we're also looking forward to working with you toward the solutions.



RALSTON PURINA
OF CANADA LTD. LTÉE